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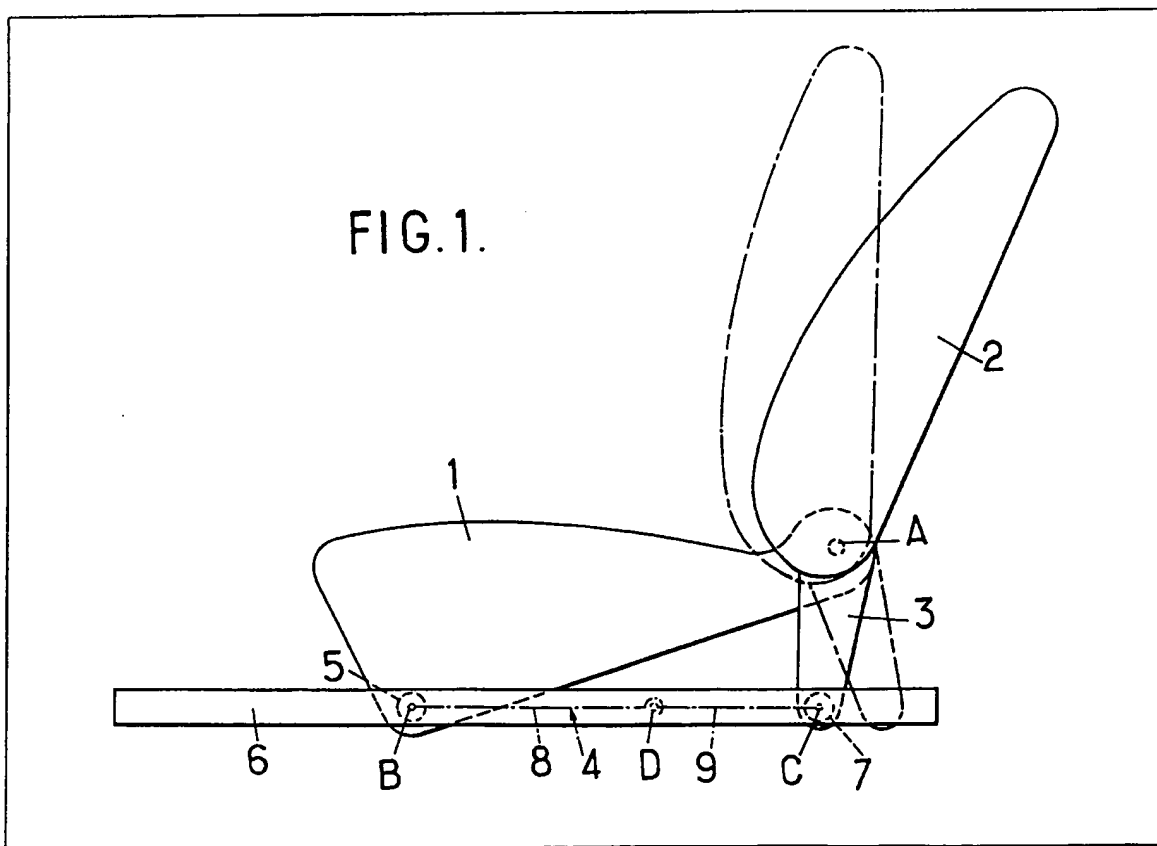
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(54) Improvements to vehicle seat
with adjustably inclinable seat-back

(57) The seat of a two-door vehicle
comprises a sitting portion 1 and a
seat-back 2 mounted on the sitting
portion for pivotal movement about a
first horizontal shaft A. The sitting
portion is mounted for pivotal
movement about a second front
horizontal shaft B adapted to slide in a

longitudinal slide 6. A mounting 3
extending from the seat-back below
shaft A is pivotably mounted about a
third rear horizontal shaft C adapted to
slide in the slide and a composite
linkage 4 connects the two shafts B
and C together at D. Means are
provided respectively (a) for adjusting
the inclination of the seat-back while
modifying the longitudinal position of
shaft C alone, (b) for adjusting the
longitudinal position of the seat by
causing this latter to slide as a whole
without deformation of the triangle
ABC, and (c) for folding the seat-back
forwards while freeing shaft B alone
by disconnecting the linkage at D.



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FIG. 1.

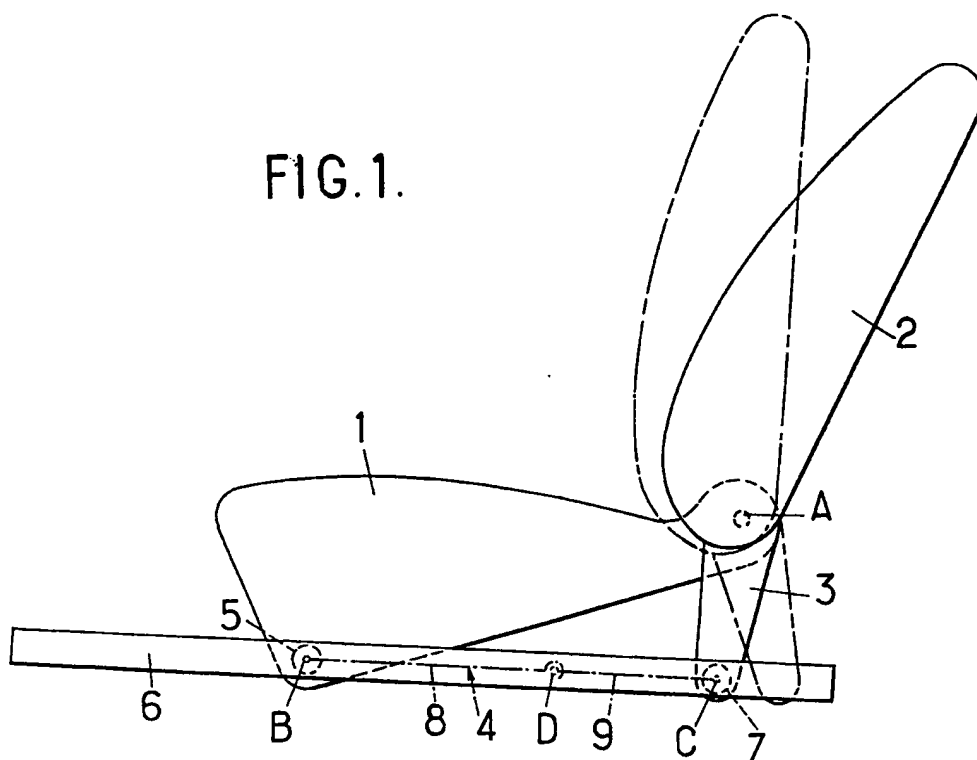


FIG. 2.

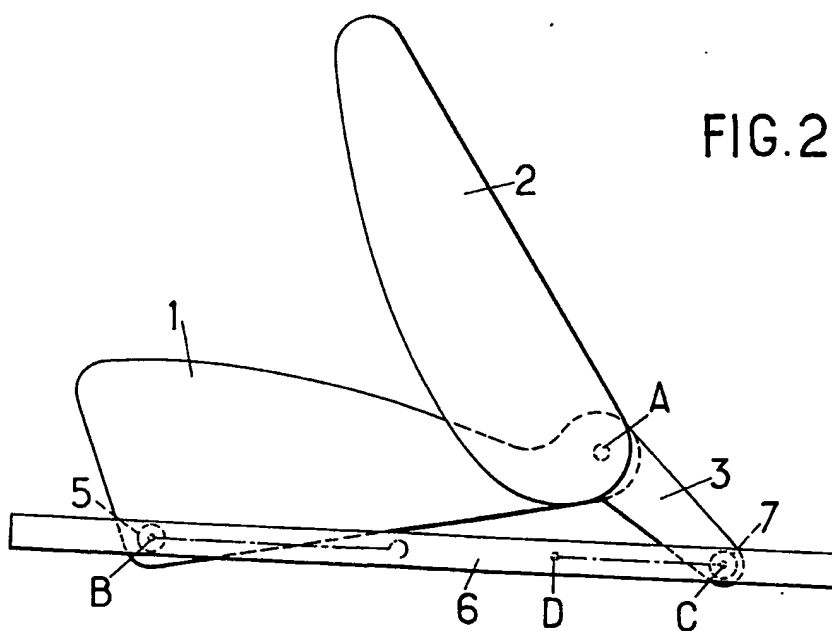


FIG. 3.

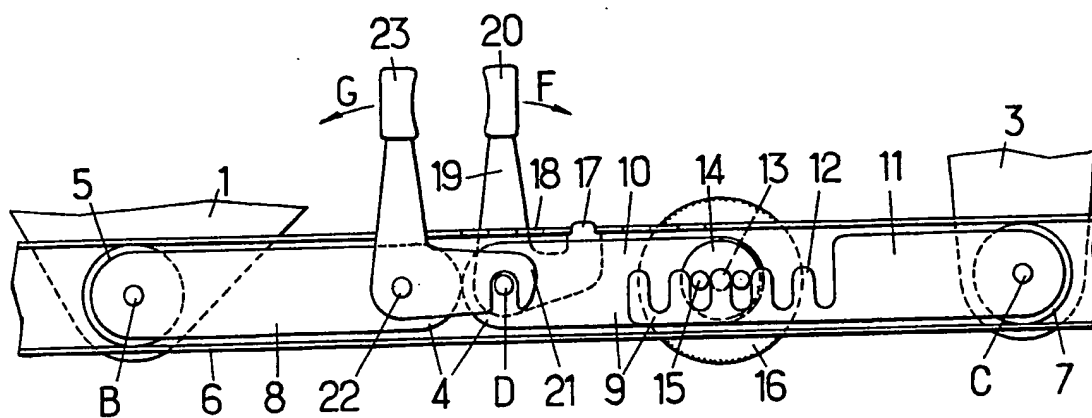
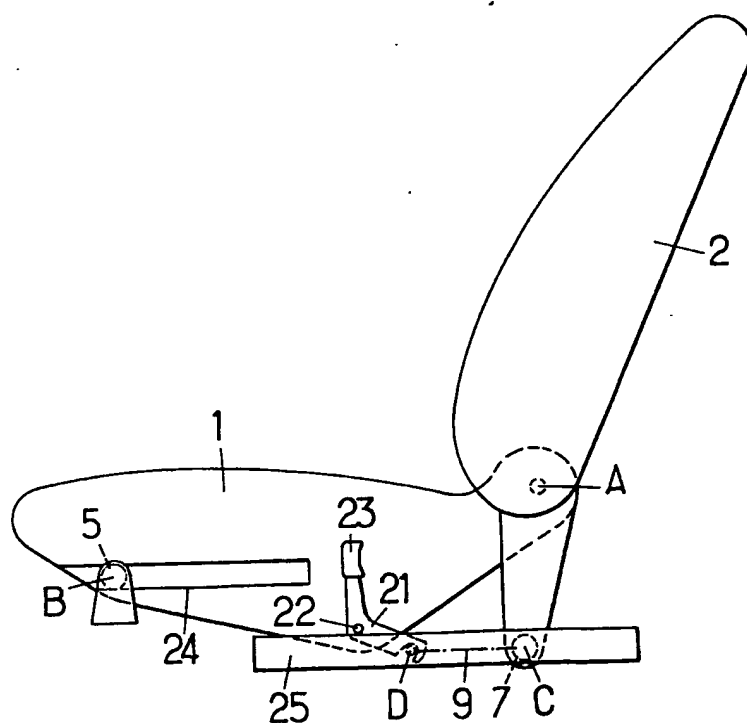


FIG.4.



SPECIFICATION

Improvements to vehicle seats with adjustable inclinable seat-back

The invention relates to vehicle seats whose seat-back can be adjustably inclined, for the service position thereof, about a transverse horizontal shaft disposed at the rear upper end of the sitting portion and can be folded forward about this shaft when the seat is not occupied so as to facilitate side access to the rear of the seat, said seats being further adjustable in their longitudinal position with respect to the chassis of the vehicle.

It aims more particularly at simplifying the adjusting mechanisms for these seats by providing particularly light and economical constructions for said seats, without for all that reducing their strength or the extent of the adjusting possibilities thereof.

To this end, the seats of the kind in question are characterized in that the sitting portion is pivotably mounted about a second horizontal transverse shaft normally disposed at the front end of the sitting portion in such a way as to provide a possibility of longitudinal movement between the sitting portion and the chassis of the vehicle at the level of this second shaft, in that a mounting integral with the seat-back and extending this latter below the first shaft is pivotably mounted about a third lower transverse horizontal shaft connected to the chassis of the vehicle so as to be able to be moved longitudinally with respect to this chassis, in that a composite linkage is provided for interconnecting the second and third shafts together and in that first control means are provided easily operable by the person sitting in the seat to adjust the distance between the second and third shafts without destroying the mutual interconnection thereof, second control means easily operable by the person sitting in the seat are further provided for releasing this seat in the longitudinal direction with respect to the chassis of the vehicle and for securing it again against longitudinal motion after adjustment of its longitudinal position effected without destroying the mutual interconnection between the second and third shafts, and third control means are also provided for cancelling out and re-establishing at will the mutual interconnection between the second and third shafts.

In preferred embodiments, recourse is further had to one and/or the other of the following arrangements:

- the pivoting assembly of the sitting portion about the second shaft and/or that of the mounting about the third shaft is provided, on each side of the seat, by means of a rotary roller and a longitudinal slide adapted to receive this roller so that the roller may roll along the slide,
- in a seat according to the preceding paragraph, each slide is integral with the chassis of the vehicle and each rotary roller is mounted on the seat,
- in a seat according to the preceding

paragraph, each slide is rectilinear and receives the two rollers corresponding respectively to the above pivoting assemblies about the second and third shafts,

- two separate slides receive respectively the rollers corresponding to the above pivoting assemblies about the second and third shafts,
- in a seat according to the preceding paragraph, the slide which receives the roller corresponding to the pivoting assembly about the second shaft is situated at a higher level than the other slide,

— the first control means, adapted for adjusting the distance between the second and third shafts, comprise, coupled respectively to these two shafts in the longitudinal direction, on the one hand a comb with vertical teeth and on the other hand the horizontal transverse shaft of a rotary part integral with a control handle and two parallel cylindrical studs, these studs being adapted, in a way known per se, to coact with the teeth so that the rotation of said part causes irreversibly longitudinal movements of the comb,

- the second control means, for adjusting the longitudinal position of the seat, comprise a rack integral with the chassis of the vehicle, a finger mounted on the sitting portion, preferably on the composite linkage so as to be able to coact with the notches of the rack, resilient means permanently urging this finger towards the bottom of one of the notches, and a lever adapted to move the finger against said resilient means,
- the composite linkage is formed, on each side of the seat, by two rigid links coupled respectively to the second and third shafts and the third control means are arranged so as to hook these two links removably one on the other at a point situated between the second and third shafts,

— the two rigid links according to the preceding paragraph are housed in the same longitudinal slide connected to the chassis of the vehicle,

— the vertical distance between the first and second shaft is greater than 15 cm.

The invention comprises, apart from these main arrangements, certain other arrangements which are preferably used at the same time and which will be more explicitly discussed hereafter.

In what follows, preferred embodiments of the invention will be described with reference to the accompanying drawings in a way which is of course in no wise limiting.

Figures 1 and 2 of these drawings show schematically in two separate positions a vehicle seat constructed in accordance with the invention. Figure 3 shows in greater detail one embodiment of the mechanisms for adjusting this seat.

Figure 4 shows, in the same position as Figure 1, a variation of the vehicle seat also in accordance with the invention.

In each case, the seat considered is a front seat for a vehicle with two doors, whose seat-back may be folded forward so as to allow access to the rear

seats of the vehicle.

This seat comprises, in a way known per se, a sitting portion 1 and a seat-back 2 pivotably mounted on the sitting portion about a transverse horizontal shaft A, called "first shaft" in what follows, situated in the rear upper zone of the sitting portion.

Furthermore, in this case:

- the sitting portion 1 is pivotably mounted about a second transverse horizontal shaft B disposed at the front of the sitting portion and connected to the chassis of the vehicle so as to allow, under certain conditions explained further on, longitudinal movement thereof with respect to this chassis,

- the seat-back 2 is extended below shaft A by a mounting 3 integral with this seat-back and pivotably mounted about a third horizontal shaft C disposed at the rear lower end of the seat and connected, like shaft B, to the chassis of the vehicle with possibilities for adjusting the longitudinal position thereof,

- and a composite linkage or connecting rod 4 — the nature of which will be discussed further on — allows the two shafts B and C to be firmly interconnected together, which makes the triangle ABC indeformable.

Three types of adjustment or operating possibilities are provided:

- first of all an adjustment is provided for the inclination of the seat-back, which is effected by moving shaft C in the longitudinal direction with respect to shaft B then fixed, without destroying the mutual interconnection between these two shafts B and C; as can be seen in Figure 1, such movement causes the modification of seat-back 2 about shaft A,

- then an adjustment is provided for forward or rearward positioning of the seat, which is effected by moving the whole of this seat in the longitudinal direction without deforming triangle ABC,

- finally, folding forward the seat-back about shaft A is provided for at the same time as moving the sitting portion forward by sliding shaft B forwards with respect to the then fixed rear shaft C, which is made possible by cancelling the mutual interconnection between these shafts B and C: the combined effect of folding seat-back 2 of the seat forward and moving it forward then allows side access to the rear seats, as can be seen in Figure 2.

- Of course, in the case of this latter figure, pushing the whole of the seat with its seat-back, including its rear shaft C, forwards may be envisaged; but it is then generally preferred to maintain this shaft C fixed since such a solution allows the seat to be put back into its initial preadjusted position after each time that the seat-back has been folded forwards, experience showing that the room freed by this operation is sufficient in practice, even for the furthest back preadjusted position.

- There will now be described, with reference to Figure 3, an embodiment for each of the

mechanisms providing the above adjustments or operations.

- In practice, in a way known per se, the essential part of these mechanisms is split up into two on each side of the seat, especially in so far as the support and guide means for the seat are concerned, so as to share out and balance the loads: some of the similar elements of these two mechanisms may be connected together by transverse bars, but the control levers are in general provided only on one of the two sides of the seat, even if the controls are effected on both sides.

- The description which follows relates to the two portions of the mechanisms considered corresponding to one of the two sides of the seat.

- The pivoting assembly of sitting portion 1 to the chassis of the vehicle about shaft B is provided by means of a roller 5 whose shaft B is integral with the sitting portion, this roller being housed in a longitudinal slide 6 so as to be able to roll therealong.

- The pivoting assembly of mounting 3 of the seat-back to the chassis about shaft C is similarly provided by means of a roller 7 whose shaft C is integral with the mounting, this roller being housed, like roller 5, in slide 6.

- This slide 6 is fixed to the floor of the vehicle and is for example formed from a rectilinear metal section having a cross-section in the form of a C, with horizontal parallel flanges connected at right angles to the same vertical intermediate web, one at least of the two horizontal flanges being advantageously extended by a vertical lip bent inwardly of the C so as to partially close this metal section and thus prevent the rollers and other parts housed therein from accidentally coming out.

- The longitudinal direction of said metal section preferably slopes slightly with respect to the horizontal so as to rise towards the front of the seat.

- The height of the portion of mounting 3 between shafts A and C is relatively high, being preferably greater than 15 cm.

- The whole is preferably arranged so that the horizontal plane corresponding to the base of the door of the vehicle providing access to the seat considered, intersects mounting 3 half-way between shafts A and C.

- The composite linkage or connecting rod 4 which connects the two shafts B and C together is here formed, on each side of the seat, by two rigid links 8 and 9 coupled respectively to these two shafts B and C and hooking one on to the other at the level of point D situated between these two shafts in a way which will be described further on.

- These two links A and B are both housed inside slide 6.

- Link 8 is formed by a monobloc piece.

- But link 9 is itself composite, being formed so that its length, i.e. distance CD, is adjustable without the indeformable kinematic connection between these two ends being interrupted, i.e.

- between shaft C and point D.

This link 9 comprises more especially an arm 10, one longitudinal end of which is hooked to link 9 in a way which will be described further on, and a comb 11 with vertical teeth 12 whose longitudinal end is coupled to shaft C.

The other end of arm 10 carries shaft 13 of a rotary part 14 integral with two cylindrical studs 15 and a control handle 16 easily accessible to the person sitting in the seat.

Studs 15 are adapted to coact, in a way known per se, with the teeth 12 so that the rotation of handle 16 causes irreversible longitudinal movements of comb 11 with respect to arm 10.

In order to make possible such an operation, in a way also known per se, shaft 13 is not pivotably mounted directly in a circular opening of arm 10, but in a vertical slit formed in this arm and it is constantly urged vertically to the bottom of the notches included between teeth 12 by a spring (not shown).

With such a mechanism, it is sufficient to rotate handle 16 in one direction or in the other so as to shorten or lengthen link 9, i.e. so as to move shaft C towards or away from point D, without breaking the continuity of their mutual connection.

As mentioned above, these adjustments cause irreversible modifications of the inclination of seat-back 2 about its pivot shaft A.

The above tooth 11 and stud 15 mechanism could be replaced by any other easily controlled mechanism capable of adjustably modifying the length of a rigid link without at any time destroying the rigid connection between the two ends thereof.

The seat is locked in its longitudinal position with respect to the chassis of the vehicle and more precisely with respect to slide 6 by cooperation of a finger 17 mounted on the composite linkage 4 with one or other of the notches or perforations 18 of a rack provided on this slide 6.

Finger 17 is for example formed by an upwardly turned nose terminating the horizontal arm of a crank lever 19 whose other vertical arm forms a control handle 20 easily accessible to the person sitting in the seat.

This lever 19 is pivotably mounted to the above link 9, particularly at the end of arm 10 forming part of this link, the furthest away from shaft C.

The perforations 18 capable of receiving the nose of finger 17 and forming the rack are here formed in the upper horizontal flange of slide 6.

A spring (not shown) is further provided for constantly urging finger 17 towards the perforations 18.

In the rest position, the relaxation of this spring results in introducing this finger 17 into one of these perforations 18, which longitudinally locks the composite linkage 4 with slide 6 while securing the seat against longitudinal movement with respect to the chassis of the vehicle.

To adjust the longitudinal position of this seat, it is sufficient to rotate lever 19 in the direction of arrow F so as to free finger 17 from its perforation 18, which frees the seat in the longitudinal direction.

It is then possible for the occupant of the seat to move this seat longitudinally as a whole, which then forms an indeformable whole, the interconnection between the two shafts B and C being then maintained.

This longitudinal adjustment is effected by causing the rollers 5 and 7 to roll in their slides 6.

When the new longitudinal position is reached, it is sufficient to release handle 20, relaxation of the spring then ensures, possibly after a final adjustment of position, that finger 17 is again introduced into a perforation 18, which again immobilizes the seat in its longitudinal position.

As far as the folding forward of seat-back 2 is concerned, for providing access to the rear seats of the vehicle, it is provided by advancing only the front shaft B.

To this end, the interconnection between this shaft B and shaft C is cancelled by mutually unhooking links 8 and 9 from each other.

The mutual hooking together of these links is here obtained, when they are in mutual longitudinal abutment (see Figure 3), by cooperation of a hook 21 pivotably mounted at 22 on the end of link 8, the furthest away from shaft B, with a stud D provided on the adjacent end of link 9: this hook 21 is actuatable, like the above lever 19, by means of a control handle 23 easy to manipulate from outside the seat, against a return spring (not shown).

To fold the seat-back of the seat forward, it is then sufficient to rotate this handle 23 in the direction of arrow G, which frees the hook 21 from stud D and mutually frees the interconnection between the two links 8 and 9, or more generally between the two shafts B and C.

If this latter shaft C then remains connected to slide 6 through finger 17, shaft B is freed in the longitudinal direction and may move forwards, when roller 5 travels in the slide 6, under the combined and simultaneous effect of folding seat-back 2 forwards and advancing the sitting portion 1 (see Figure 2).

This double effect frees a considerable space behind the seat, which allows easy access to the rear seats, even if shaft C is in a relatively far-back position of longitudinal adjustment.

It is then sufficient to lift up the seat-back again to its initial position in order to move the seat-back at the same time as far as its original longitudinal position, in which hook 21 is again opposite stud D and can again cooperate therewith.

This hooking together again is advantageously made automatic by providing appropriate ramps adapted to coact with the hook 21 during its rearward return.

Following which and whatever the embodiment adopted, there is finally provided a vehicle seat whose construction and modes of adjustment follow sufficiently from what has gone before.

This seat has a certain number of advantages with respect to those previously known, in particular in so far as the simplicity of its adjusting mechanisms is concerned, as well as the lighter

weight and saving which follow therefrom.

As is evident and as it follows moreover already from what has gone before, the invention is in no wise limited to those of its modes of application and embodiments which have been more especially considered; it embraces, on the contrary, all variations thereof.

In particular the two links 8 and 9 could be replaced by a single linkage, the means for length adjustment and the removable hooking means being then transferred respectively to the level of the two shafts B and C or to the level of one of these shafts; or else, in accordance with an intermediate solution, link 8 could form a single block with arm 10, the hooking stud D then being transferred to shaft B.

In particular again, the two slide sections which are situated on each side of the seat for guiding the two above rollers 5 and 7, with respective shafts B and C, could be independent of each other instead of being formed by two parts of the same section.

They could even be disposed so as not to be in the extension of each other.

This is what has been shown in Figure 4, in which the slide section 24 for guiding roller 5 is parallel to section 25, for guiding roller 7, and disposed higher than section 25.

The same goes for the front roller-slide pair, the respective supports of the two components of this pair could be reversed with respect to the above described solution.

Thus, in the variation of Figure 4, the upper front slide 24 has been provided, not integral with the chassis, but formed in a lateral cheek of the sitting portion whereas the corresponding roller 5, then with fixed shaft, has been assumed supported by the chassis.

In the embodiment of this Figure 4, the above hook 21 is to be found again adapted to cooperate with stud D provided on link 9 in the same way as before, and a rigid frame (not shown) is provided between slide 24 and the pivot shaft 22 for this hook 21 so as to play the role of link 8 in the preceding embodiment.

In other words, said frame interconnects the stud with the second shaft B, which is then always perfectly determined, even if it is not given concrete form in the sitting portion: said shaft B may in fact be considered in a way as being replaced by the slide 24 in the above definition.

CLAIMS

1. A vehicle seat whose seat-back (2) is adjustably inclinable, for the service position thereof, about a transverse horizontal shaft (A) disposed at the rear upper end of the sitting portion (1), and can be folded forwards of this shaft when the seat is not occupied so as to facilitate the side access to the rear of this seat, said seat being further adjustable in longitudinal position with respect to the chassis of the vehicle, characterized in that the sitting portion is pivotably mounted about a second transverse horizontal shaft (B) normally disposed at the front end of the

sitting portion so as to provide a possibility of longitudinal movement between the sitting portion and the chassis of the vehicle at the level of this second shaft, in that a mounting (3) integral with the seat-back and extending this latter below the first shaft is pivotably mounted about a third lower transverse horizontal shaft (C) connected to the chassis of the vehicle so as to be able to be moved longitudinally with respect to this chassis, in that a composite linkage (4) is provided for interconnecting together the second and third shafts and in that there are further provided first control means (11—16) easily operable by the person sitting in the seat for adjusting the distance between the second and third shafts without destroying the mutual interconnection therebetween, second control means (17—20) easily operable by the person sitting in the seat for freeing this seat in the longitudinal direction with respect to the chassis of the vehicle and for immobilizing it again in the longitudinal direction, after adjustment of its longitudinal position provided without destroying the mutual interconnection between the second and third shafts, and third control means (21—23) for cancelling and re-establishing at will the mutual interconnection between the second and third shafts.

2. The vehicle seat according to claim 1, characterized in that the pivoting assembly of the sitting portion about the second shaft (B) and/or that of the mounting about the third shaft (C) is provided on each side of the seat, by means of a rotary roller (5, 7) and a longitudinal slide (6) adapted to receive this roller so that the roller may roll along the slide.

3. The vehicle seat according to claim 2, characterized in that each slide (6) is integral with the chassis of the vehicle and in that each rotary roller (5, 7) is mounted on the seat.

4. The vehicle seat according to claim 3, characterized in that each slide (6) is rectilinear and receives the two rollers corresponding respectively to the above pivoting assemblies about the second and third shafts.

5. The vehicle seat according to any one of claims 2 and 3, characterized in that two separate slides receive respectively the two rollers corresponding to the above pivoting assemblies about the second and third shafts.

6. The vehicle seat according to claim 5, characterized in that the slide (24) which receives the roller (5) corresponding to the pivoting assembly about the second shaft (B) is situated at a higher level than the other slide (25).

7. The vehicle seat according to any one of the preceding claims, characterized in that the first control means, adapted to adjust the distance between the second (B) and third (C) shafts, comprise, coupled respectively to these two shafts in the longitudinal direction, on the one hand a comb (11) with vertical teeth (12) and on the other hand the transverse horizontal shaft (13) of a rotary part (14) integral with a control handle (16) and two parallel cylindrical studs (15), these

studs being adapted to coact, in a way known per se, with the teeth so that rotation of said part causes irreversibly longitudinal movements of the comb.

- 5 8. The vehicle seat according to any one of the preceding claims, characterized in that the second control means, for adjusting the longitudinal position of the seat, comprise a rack integral with the chassis of the vehicle, a finger (17) mounted
10 on the sitting portion, preferably on the composite linkage (4) so as to be able to coact with the notches (18) of the rack, resilient means permanently urging this finger to the bottom of one of the notches and a lever (20) adapted to
15 move the finger against said resilient means.
9. The vehicle seat according to any one of the preceding claims, characterized in that the composite linkage (4) is formed, on each side of the seat, by two rigid links (8, 9) coupled
20 respectively to the second and third shafts and in

that the third control means (21) are arranged so as to removably hook these two links one on the other at a point (D) situated between the second and third shafts.

- 25 10. The vehicle seat according to claim 9, characterized in that the two rigid links (8, 9) are housed in the same longitudinal slide (16) connected to the chassis of the vehicle.
11. The vehicle seat according to any one of the preceding claims, characterized in that the vertical distance between the first (A) and the third (C) shaft is greater than 15 cm.
12. A vehicle seat substantially as hereinbefore described with reference to, and as shown in,
35 Figures 1, 2 and 3 of the accompanying drawings.
13. A vehicle seat substantially as hereinbefore described with reference to, and as shown in, Figure 4 of the accompanying drawings.
14. Any novel feature or combination of
40 features described herein.